

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

23. (Currently amended) A network router comprising:

an input switch;

an output switch;

a controller, the controller comprising a plurality of look-up engines, each of the look-up engines receiving look-up requests in a round robin fashion; and

A ~~a~~ memory for storing data for access by a longest prefix match program ~~being executed on a data processing system~~, the program comprising:

a data structure stored in the memory, the data structure including information resident in a database used by the longest prefix match program and including:

a large table at a root, the root branching to nodes containing small trie tables, each trie table addressed by a span of Internet protocol (IP) address bits to locate an indexed trie entry, the indexed trie entry including a route pointer and a trie pointer.

24. (Currently amended) The router ~~memory~~ of claim 23 wherein each of the small trie tables comprises:

prefix match fields for each indexed entry;

a population count of pointers; and

hidden prefix entries.

26. (Currently amended) The router ~~memory~~ of claim 24 wherein the each of the hidden prefix entries hold shorter prefix entry pointers.

27. (Currently amended) The router memory of claim 24 wherein the small trie tables are stored in a static random access memory (SRAM) and used for route lookups, route adds and route deletes.

28. (Currently amended) The router memory of claim 24 wherein the indexed trie entry is a 32-bit longword.

29. (Currently amended) A network router comprising:

a plurality of input ports linked to an input switch;  
an output switch linked to a plurality of output ports;  
a controller, the controller comprising a plurality of look-up engines, each of the look-up engines receiving look-up requests in a round robin fashion; and

a memory, the memory including a ~~A~~ method of searching a database for a prefix representing a destination address, the method comprising:

reading a data structure stored in ~~a~~ the memory, the data structure comprising a large table at a root, the root branching to two nodes containing small trie tables, each trie table addressed by a span of Internet protocol (IP) address bits to locate an indexed trie entry, the indexed trie entry including a route pointer and a trie pointer;

traversing in parallel the two trie tables of trees to find a match of an trie entry to the prefix.

30. (Currently amended) The router method of claim 29 wherein the route pointer represents the destination address and the trie pointer points to a next small trie table.

31. (Currently amended) The router method of claim 29 wherein the small trie tables comprise:

prefix match fields for indexed table entries;

a population count of pointers; and

hidden prefix entries that hold shorter prefix route entry pointers.

32. (Currently amended) The router method of claim 29 further comprising reporting a non-match if the prefix does not match an entry.

33. (Currently amended) The router method of claim 29 wherein a first large table is a single 64k entry table that is indexed by bits 31:16 of an internet protocol (IP) address.

34. (Currently amended) The router method of claim 29 wherein a second large table is a single 256 entry table that is indexed by bits 31:24 of an internet protocol (IP) address.

35. (Currently amended) The router method of claim 33 wherein the small tables are dynamically allocated and comprise:

a tree with each node representing 4 bits of addresses covering an extension of 1-4 bits of a prefix entry from a previous tree.

36. (Currently amended) The router method of claim 34 wherein the small tables are dynamically allocated and comprise:

a tree with each node representing 4 bits of addresses covering an extension of 1-4 bits of a prefix entry from a previous tree.